



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/920,752	08/03/2001	Ken Matsumoto	862.C2319	5950

5514 7590 03/27/2003

FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER

CAPUTO, LISA M

ART UNIT

PAPER NUMBER

2876

DATE MAILED: 03/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/920,752

Applicant(s)

MATSUMOTO, KEN

Examiner

Lisa M Caputo

Art Unit

2876

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

Regarding page 27 line 4: Replace "1201" with --201-- in order to be consistent with the figures.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-2 and 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakahara (U.S. Patent No. 6,048,655) in view of Iizuka (U.S. Patent No. 4,999,671).

Nakahara teaches a method of carrying and aligning a substrate. Nakahara discloses that one embodiment of an apparatus for carrying a substrate according to the present invention will hereafter be described with reference to FIG. 1. FIG. 1 is a perspective view schematically illustrating the substrate carrying apparatus. The same members as those in FIG. 7 are marked with like numerals. The substrate carrying apparatus in this embodiment is constructed of a substrate storage part 1, a carrier arm 3, a carrier 4, a load arm 5, an unload arm 6, a temporary storage shelf 8 and a reticle stage 7. The substrate storage part 1 stores a plurality of substrate casings 2 receiving

Art Unit: 2876

reticles R. The carrier arm 3 is movable in a direction Y through a slider 35. The carrier arm 3 is also movable in a direction Z through a slider 34. The carrier arm 3 takes only a reticle R out of a substrate casing 2 in the substrate storage part 1 and carries the reticle R to a carry position CA1. The carry position CA1 is a position where the reticle R is delivered from the carrier arm 3 to the carrier 4. The carrier arm 3 is formed with a vacuum adsorption hole. The reticle R is held and released by turning ON and OFF an unillustrated vacuum pump. The carrier 4 is movable in a direction X through a slider 36. The carrier 4 has an adsorption hole formed in a lower part thereof. The reticle R is held and released by turning ON and OFF an unillustrated vacuum pump. Further, the carrier 4 includes a prealignment mechanism having four fiducial sides. The reticle R is caught in from two directions orthogonal to each other on the basis of these four sides, thus effecting a prealignment. The carrier 4 prealigns the reticle R and simultaneously carries the reticle R to a position CA2 from the position CA1. The load arm 5 is movable in the direction Y through a slider 31. The unload arm 6 is movable in the direction Y through a slider 32. Further, the load arm 5 and the unload arm 6 are also movable in a direction Z through a slider 33. The load arm 5 and the unload arm 6 are individually movable in the direction Y but move together in the direction Z. The load arm 5 and the unload arm 6 are, as in the carrier arm 3, formed with adsorption holes. These arms are capable of adsorptively holding and releasing the reticle R by turning ON and OFF a vacuum pump (not shown). The reticle stage 7 is mounted with the reticle R for an exposure. The reticle stage 7 is provided above a projection optical system PL. The reticle R is carried onto the reticle stage and then located. A position detecting optical system 39 detects

Art Unit: 2876

an alignment mark formed on the reticle R, thus measuring a position of the reticle R. Positional information of the reticle R is given from the position detecting optical system 39 and transmitted to a main control system 100. The main control system 100 controls a motor 37. The main control system 100 locates the reticle stage 7 with the aid of the motor 37 so that an optical axis AX of the projection optical system PL coincides with the center of the reticle R. The main control system 100 is herein capable of measuring a position of the reticle stage 7 from, e.g., a rotational quantity of the motor 37. The apparatus shown in FIG. 1 is provided with a bar code reader 30 for reading bar codes (not shown) formed on the reticle R. This bar code information is transmitted to the main control system 100 (the reader is arranged in the apparatus and the holding member as recited in claim 2 of the instant application). Pieces of identifying information (designations) of the reticles R are recorded in the bar codes. A sequence for selecting a plurality of reticles R is registered beforehand in the apparatus shown in FIG. 1. Based on the information of the bar codes information and the reticle information registered, it is possible to confirm whether or not the reticle R to be selected is correctly carried. Based on the identifying information of the reticle R, it is also feasible to count the number of times with which the same reticle R is carried. Further, pattern information and exposure conditions are recorded in the bar codes. The pattern information is utilized for setting the exposure conditions when forming an image of a pattern of the reticle on a wafer W placed on a two-dimensionally movable wafer stage 38 through the projection optical system PL. The load arm 5 and the unload arm 6 cooperate to move the reticle R between the reticle stage 7 and the temporary storage

Art Unit: 2876

shelf 8 (the apparatus extracts the substrate from a plurality of containers and the pair of holding arms works to transfer the substrate as recited in claims 13-14 of the instant application). The reticles R are, however, carried to the temporary storage shelf 8 by the unload arm 6 up to a termination of a lot size of the reticles R to be used. The temporary storage shelf 8 is positioned between the position CA2 and the reticle stage 7. Hence, a carry time is smaller than in the carry of the reticle R from the substrate storage part 1 to the reticle stage 7. The main control system 100 controls driving of the reticle stage 7 and the wafer stage 38 as well as driving of the carrier arm 3, the carrier 4, the load arm 5 and the unload arm 6. The main control system 100 also generalizes the whole apparatus by performing a central management about the information given from the bar code reader 30 described above, the sequence to carry the reticles R, the ON/OFF vacuum control and the exposure conditions (see Figure 1, col 3 line 42 to col 4 line 65). Hence Nakahara teaches a substrate transfer apparatus that comprises a transfer means having a holder member, reading means to optically read a pattern on the substrate, and control means for moving the holding member.

Regarding claims 1 and 15-16 Nakahara fails to teach that the reading means has first and second parts to optically read the pattern.

Iizuka teaches a reticle conveying device. Iizuka discloses that FIG. 3 is an explanatory view showing a reticle conveying system according to an embodiment of the present invention. In FIG. 3, reference numerals 4--4 denote reticle cassettes or containers of the type disclosed in Japanese Laid-Open Patent Applications, Laid-Open Nos. 78084/1987 and 76531/1987. Reference numerals 5--5 denote cassette holders

Art Unit: 2876

each for holding thereon a cassette 4. Each reticle cassette 4 is adapted to keep therein a reticle 6. Reference numeral 7 denotes a bar-code reader which is operable also as a pattern position detecting device. Also, denoted generally at P1 in FIG. 3 is a first cassette keeping or storing station which corresponds to the position of the cassette library 2 shown in FIGS. 1 and 2. Further, denoted at P2 is an elevator station for lifting a cassette holder 5, extracted out of the cassette keeping station P1, to a predetermined position. Of course, a cassette holder 5 placed at the elevator station can be moved downwardly back to the cassette keeping station P1. Denoted at P3 in FIG. 3 is a reticle extracting station (a second cassette keeping station) at which a reticle 6 is extracted out of a cassette 4 having been moved to this station, together with the cassette holder 5, from the elevator station P2. The reference P4 denotes a reticle delivering station (a first delivering station) for delivering a reticle 6 to a mechanism operable to move the received reticle 6 upwardly. The reference P5 denotes an inspecting station for inspecting the presence/absence of foreign particles on a reticle supplied thereto. The reference P6 denotes a reticle delivering station (a second delivering station) for delivering a reticle 6 to a mechanism which is operable to convey a reticle 6 to an exposure station P7 and also to convey the reticle, placed at the exposure station, back to the second delivering station. The reference P8 denotes a vacant cassette stand-by station at which a vacant cassette 4 is placed, waiting to receive a corresponding reticle 6 being used in an exposure process at the exposure station P7 (see Figure 3, col 4 lines 29-66). Hence Iizuka teaches a barcode reader

that is also a pattern position detecting device, and further, it is obvious that the reading means have first and second parts for the two different capabilities.

In view of the teaching of Iizuka, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ a barcode reader with two parts so that verification of the correct positioning and data transfer can be obtained. Regarding claim 16, having multiple semiconductor manufacturing apparatuses is a duplication of parts and it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ a plurality of semiconductor manufacturing apparatuses so that the work to be accomplished in a faster, more efficient way (i.e. there is a back-up in case one of the machines malfunctions).

Regarding claims 11-12, Nakahara fails to teach that the second part of the reading means is in the transfer system.

Iizuka teaches the barcode reader which is operable as a pattern position detecting device (see col 4).

In view of the teaching of Iizuka, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the second part of the reading means in the transfer part of the apparatus since it is well known in the art that a position detector is favorably employed as a mobile component to track the movement of the substrate.

3. Claims 3-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakahara (U.S. Patent No. 6,048,655) as modified by Iizuka (U.S. Patent No.

Art Unit: 2876

4,999,671) and further in view of Tanaka et al. (U.S. Patent No. 4,716,299, from hereinafter "Tanaka"). The teachings of Nakahara as modified by Iizuka have been discussed above.

Regarding claims 3-10, Nakahara/Iizuka fails to teach the set-up specifics of the reading means (i.e. reflecting/illumination portion) and the source of light.

Tanaka teaches an apparatus for conveying and inspecting a substrate. Tanaka discloses that FIGS. 1 and 2 schematically show the construction of a conveying apparatus according to an embodiment of the present invention. A stepper SR having an illuminating light source, a projection lens system, a wafer stage, etc., not shown, with a reticle stage 30, transfers a pattern to a wafer or the like by the use of a reticle 1. The reticle 1 is designed so as to be horizontally conveyed onto the reticle stage 30 from the front of the stepper SR and placed on the stage 30. On the right-hand side short of the stepper SR as viewed from the front thereof, there is disposed a reticle library RL. A plurality of reticle cases CS each containing a reticle 1 therein in a hermetically sealed state are mountable in piled relationship on the library RL. An openable-closable door is provided in these cases CS at a position which permits the reticle 1 to be horizontally removed, and the cases CS are mounted on the library RL so that the door faces the space in front of the stepper SR. The structure of such cases CS and the mechanism for mounting them on the library RL are the same as those disclosed in detail, for example, in the aforementioned U.S. Pat. No., 4,422,547 and therefore need not be described herein. In the present embodiment, however, a case containing therein a reticle with a pellicle can also be mounted on the library RL. The

case containing therein the reticle with a pellicle is only thicker by an amount corresponding to the height of the pellicle frame and the basic structure thereof is entirely the same as that disclosed in the aforementioned U.S. patent.

On that side opposed to the library RL with the front space of the stepper SR interposed therebetween, there is disposed a conventional foreign particle checking device (hereinafter referred to as the particle checker) PC for checking foreign particles such as dust on a reticle 1 without a pellicle. This particle checker PC, as disclosed, for example, in U.S. Pat. No. 4,468,120, is provided with a slider 18 for horizontally supporting the reticle 1 thereon and moving it in a horizontal direction (X direction). The particle checker PC is designed such that while the reticle 1 is one-dimensionally scanned by the slider 18, a laser light spot from a laser light source main-scans the surface of the reticle 1 in Y direction orthogonal to X direction and a plurality of photoelectric converters disposed at different positions receive the scattered light from a foreign particle adhering to the reticle 1, whereby on the basis of the photoelectric signals, the presence of adherence of the foreign particle, the position of adherence of the foreign particle, the state of adherence of the foreign particle or the size of the foreign particle is detected (laser source utilized as recited in claims 8 and 10 of the instant application). The slider 18 is moved along a guide 19 by a driving device in a driving unit 20. Also, a pellicle checking device (hereinafter referred to as the pellicle checker) PRC is provided on the lowermost portion of the library RL to check a foreign particle on a reticle with a pellicle, that is, to check relatively large dust adhering onto the pellicle. The basic construction of this pellicle checker PRC is similar to that which is

Art Unit: 2876

disclosed in Japanese Laid-open Patent Application No. 80546/1982, and will later be described in detail...Also, in the conveying apparatus according to the present embodiment, a bar code reader 24 for reading a bar code formed on the reticle is provided on a plate 7 movable in Z direction. This reader 24 is designed to read the bar code formed around the pattern area of the reticle by a reflection type photosensor, during the movement of the reticle in R direction in which it is drawn out of one of the cases CS. The bar code contains reticle information and is provided with an amount of information corresponding to 10-50 characters representing the distinction of the reticle. The reticle information is read into the stepper SR as the data for the control of the exposure process...In the pellicle checker PRC, there is provided a laser light supplying system comprising two semiconductor laser light sources 50, 51, lens systems 52, 53 for forming the laser light from the laser light sources into substantially parallel condensed laser light beams LB1, LB2, and mirrors 54, 55 (as recited in claim 4 of the instant application) for applying the parallel laser light beams LB1, LB2 from the lens systems 52, 53 substantially horizontally to the pellicle on the upper surface and the pellicle on the lower surface, respectively. The application orbit S1 on the pellicles by the laser light beams LB1, LB2 is determined so as to extend slenderly in a direction orthogonal to the movement of the arm 2 in R direction. Further, the laser light beams LB1 and LB2 applied to the pellicles are reflected by mirrors 56 and 57, respectively, whereafter they enter a light trap 58 so as not to be stray light in the pellicle checker PRC and are absorbed in this light trap. The vertical spacing between the laser light beams LB1 and LB2 is determined so as to be equal to the spacing between the

Art Unit: 2876

pellicles on the upper and lower surfaces. Accordingly, if the arm 2 is determined at a predetermined position in Z direction and is advanced in R direction, the pellicles on the upper and lower surfaces will be scanned at the same time by the laser light beams LB1 and LB2 (see Figures 1-4, col 2 line 46 to col 5 line 41). Hence Tanaka teaches the use of reflecting and illuminating portions, mirrors, and lasers to employ the reading means.

In view of the teaching of Tanaka, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make a reflecting portion (employed with mirrors) on an opposite surface of the substrate to reflect light from an illumination portion because this is a conventional method of providing for optical reading of bar codes and other elements since it is efficient and cost effective. In addition, the semiconductor laser source is a conventional and effective way of providing illumination. Regarding claims 5-7, it would have been obvious to replace the mirror with white tape, a corner cube, or mirror-finishing a portion of the holding member because these devices are analogous to the mirror, will have the same effect, and are design choices.

4. Claims 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakahara (U.S. Patent No. 6,048,655) as modified by Iizuka (U.S. Patent No. 4,999,671) and further in view of Chen et al. (U.S. Patent No. 5,822,524, from hereinafter "Chen"). The teachings of Nakahara as modified by Iizuka have been discussed above.

Regarding claims 17-20, Nakahara/Iizuka fails to teach that the plurality of apparatuses are connected via a local area network and further, that there are databases stored externally to provide data about the apparatus (i.e. maintenance etc.).

Chen teaches a system for retrieval of multi-media files over computer networks. Chen discloses For example, instead of storing paper technical manuals, which must be searched manually, workers on a manufacturing floor could use a computer terminal, called a "client machine", to interactively access a large collection of multimedia training materials stored in a centralized "server". A "client machine" is a computer or terminal having a screen that an individual uses to access and display video files. It has at least three component processes: MM (Multimedia) application, i.e., the display of a video clip; Client Agent, i.e., software (computer program to access the server) and Network Interface, i.e., an interface card. A server (server machine) is a computer, for example, a "mini-computer" or workstation computer or super-computer, connected to a number of computer terminals (client machines) in a Local Area Network (LAN) or other computer networks, such as metropolitan area networks, i.e., FDDI and high speed wide areas networks, such as ATM. The server stores and delivers digital video clips to multiple client machines in a network. The server includes, at least, three component process: Network Interface, i.e., an interface card; Server Control, i.e., software to control access and delivery of stored video clips; and Storage Subsystem, i.e., digital memory storage of video. In interactive access, the user operates his client machine to request multimedia files from the server for display on the screen of the client machine and the server responds to the user's requests. For example, a worker, at the press of a key, could have the server retrieve more detail, on the subject of his choice, using text and video. In this arrangement, a centralized server (as opposed to an individual computer) stores the necessary multimedia information. This arrangement exists

Art Unit: 2876

because video clips (usually video 0.1 to 10 minutes long) require a large amount of computer storage. For example, a one-minute video clip, compressed, may be over 12,000,000 bytes (12 Mb--a byte here being 8 digital bits) in size. Thus, having a large selection of video clips on the individual computers of a network would not be economical. Multimedia technology may also provide new forms of entertainment, video-on-demand being one well-known example. In a video-on-demand system, a centralized networked storage server stores a large collection of videos, such as entire full-length feature films in video form (90-180 minutes). A plurality of users may simultaneously retrieve their preferred video features at their selected viewing times (see col 1 lines 21-64). Hence Chen teaches a method of networking computers and apparatuses in order to share information through central databases.

In view of the teaching of Chen, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ a network to connect the apparatuses together and to a central database so that information can be shared and the system is employed efficiently. In addition, even though Chen teaches these networks in a multimedia file aspect, it is analogous to the system of semiconductor apparatuses because on the base level the network is a mode for transmitting data, no matter what the nature.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: U.S. Patent No. 5,929,978 to Masaki which discloses a projection exposure apparatus.

Art Unit: 2876

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Lisa M. Caputo** whose telephone number is **(703) 308-8505**. The examiner can normally be reached between the hours of 8:30AM to 5:00PM Monday through Friday. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael G. Lee can be reached on 703-305-3503. The fax phone number for this Group is (703)308-7722, (703)308-7724, or (703)308-7382.

Communications via Internet e-mail regarding this application, other than those under 35 U.S.C. 132 or which otherwise require a signature, may be used by the applicant and should be addressed to [lisa.caputo@uspto.gov].


All Internet e-mail communications will be made of record in the application file. PTO employees do not engage in Internet communications where there exists a possibility that sensitive information could be identified or exchanged unless the record includes a properly signed express waiver of the confidentiality requirements of 35 U.S.C. 122. This is more clearly set forth in the Interim Internet Usage Policy published in the Official Gazette of the Patent and Trademark on February 25, 1997 at 1195 OG 89.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.



LMC

March 23, 2003



MICHAEL G. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800